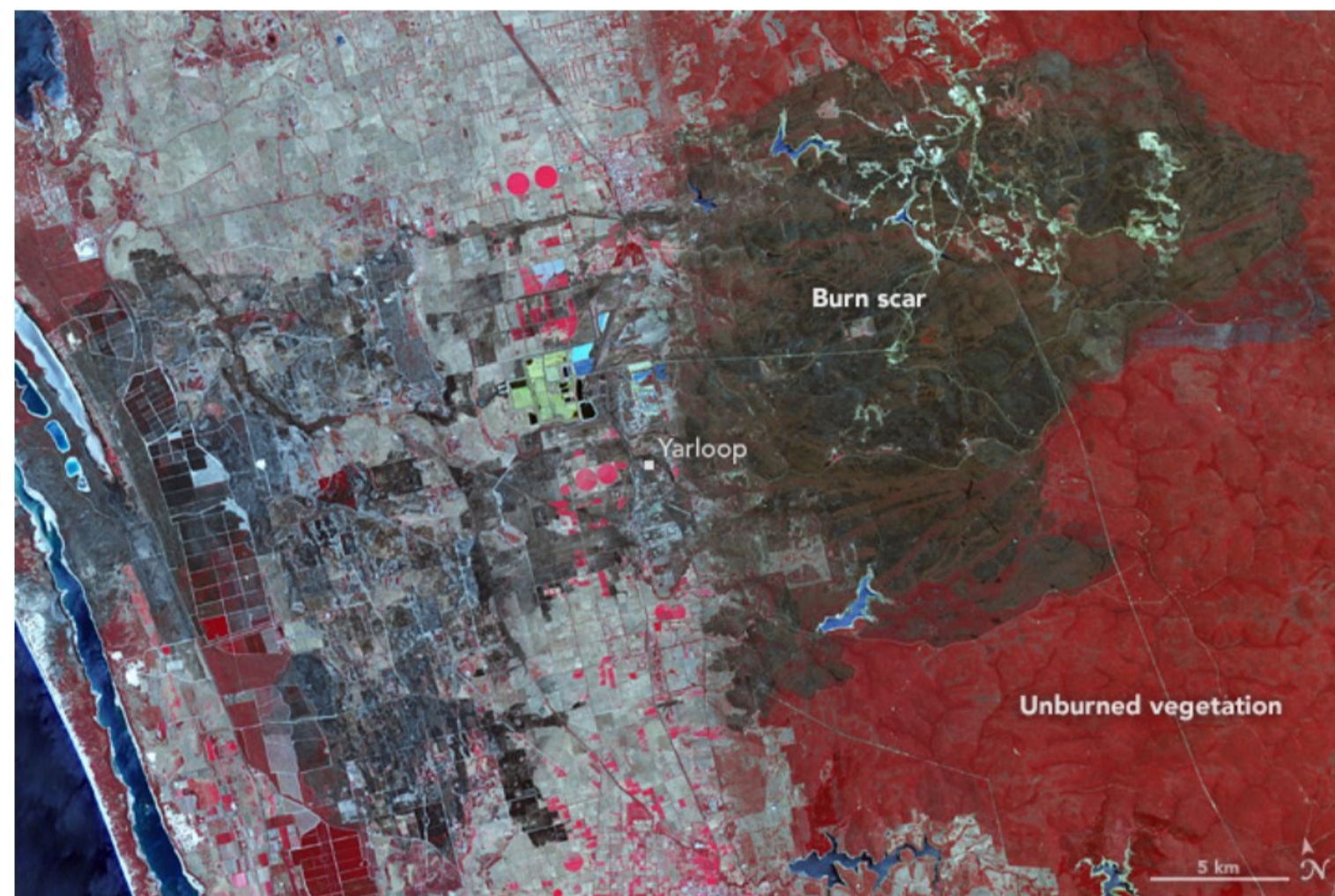


The Near-miss Effect of Forest Fires

Evidence from Western Australia

1. Waroona fire of 2016

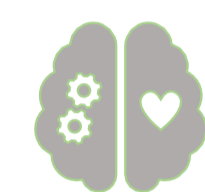


Source: NASA Earth Observatory – January 16, 2016

2. Associated impacts

- 2 deaths
- 181 homes destroyed
- 69,165 ha burnt

High-consequence, low probability & isolated event



Information update on forest fire risk ?

Near-miss effect on the housing market ?



3. The near-miss concept

Near-miss events are those where negative outcomes, such as damage and destruction from a forest fire event, could have happened but, by chance, did not (Dillon & Tinsley, 2008).

These occur outside the burn scar ('miss' component), close enough to receive information updates ('near' component), but far enough to ignore direct impacts.

4. Research question

Are pure information effects from forest fire events capitalized into property prices? If so, what is their sign, size, and persistence?

5. Insights from the literature

- Positive near-miss effects can be expected if near-miss events highlight resiliency rather than vulnerability, as suggested by (1). However, first-hand evacuation experience associated with higher willingness to act/mitigate, favouring negative near-miss effects.
- Individuals are vulnerable to risk perception biases when confronted with natural disasters: availability bias (5), confirmatory

bias (6), and outcome bias (7) – thereby disregarding information updates in favour of instances which come to mind with ease (5), previous beliefs (6), and/or the 'lucky' outcome (7). Depending on the prevailing bias, positive and negative near-miss effects can be expected.

- Heightened risk perceptions after near-miss events are short-lived (2)(3)(4) – persistence is low.

6. Methodology

To identify and measure pure information effects we will estimate a hedonic price (HP) equation under a difference-in-difference approach.

Price P of property h at time t is expressed as a function of its structural, neighbourhood, and environmental attributes Z , forest fire risk p , risk moderating variables r , dummy identifiers for post-fire ($Fire$) and near-miss properties (NM), an interaction term, and error μ .

$$HP: \ln P_{ht} = \alpha + \sum_{j=1} \beta_j Z_{hj} + \phi p_h + \underline{\delta} r_h + \gamma Fire_{ht} + \theta NM_h + \varphi (Fire_{ht} \times NM_h) + \mu_{ht}$$

time effect
Group effect
Treatment response (near-miss effect)